

WHAT IS CLAIMED IS:

1. An injector system comprising, in combination, an injector and a syringe for injecting fluid into a patient,

the syringe comprising:

a body;

a plunger movably disposed within the body; and

an encoding device providing syringe information; and

the injector comprising:

a housing;

a motor disposed within the housing;

a controller operably associated with the motor;

a sensor operably associated with the controller and operable to read the encoded syringe information provided by the encoding device;

a drive member disposed in the housing and powered by the motor, the drive member operable to automatically advance and engage the plunger when the syringe is mounted on the injector; and

a plunger engagement detection device operably associated with the controller and operable to indicate when the drive member of the injector has engaged the plunger of the syringe.

2. The injector system of Claim 1 wherein the injector controller determines that the syringe is empty from the syringe information provided by the encoding device and causes the drive member to advance the plunger forward within the syringe body to expel air from the syringe.

3. The injector system of Claim 1 wherein the injector controller determines that the syringe is prefilled from the syringe information provided by the encoding device and substantially stops forward advancement of the drive member upon engagement of the drive member with the plunger.

4. The injector system of Claim 1 wherein the injector controller substantially stops advancement of the drive member upon engagement of the drive member with the plunger of the syringe.

5. The injector system of Claim 1 wherein the plunger engagement detection device comprises a motor current measuring device operably associated with the motor for measuring motor current, the motor current being affected by increased resistance to advancement of the drive member upon engagement thereof with the plunger of the syringe.

6. The injector system of Claim 1 wherein the plunger engagement detection device comprises a sensor disposed on the drive member, the sensor operable to detect engagement of the drive member with the plunger.

7. The injector system of Claim 6 wherein the sensor comprises a light source and a light sensor.

8. The injector system of Claim 7 wherein engagement of the drive member with the plunger substantially prevents light from the light source from reaching the light sensor, thereby indicating that the drive member has engaged the plunger.

9. The injector system of Claim 7 wherein the drive member comprises a forward end defining a passage therein having opposing sidewalls, the light source being disposed on one sidewall of the passage and the light sensor being disposed on the other sidewall of the passage.

10. The injector system of Claim 9 wherein the plunger comprises a rearward projecting element operable to extend into the passage when the drive member engages the plunger, the rearward projecting element operable to substantially prevent light from

the light source from reaching the light sensor, thereby indicating that the drive member has engaged the plunger.

11. The injector system of Claim 1 wherein the plunger engagement detection device comprises a sensor disposed on the plunger, the sensor operable to detect engagement of the drive member with the plunger.

12. The injector system of Claim 11 wherein the sensor comprises a light source and a light sensor.

13. The injector system of Claim 12 wherein engagement of the drive member with the plunger substantially prevents light from the light source from reaching the light sensor, thereby indicating that the drive member has engaged the plunger.

14. The injector system of Claim 12 wherein the plunger comprises two capture members extending rearward therefrom, the light source being disposed on one capture member and the light sensor being disposed on the other capture member.

15. The injector system of Claim 14 wherein engagement of the drive member with the plunger substantially prevents light from the light source from reaching the light sensor, thereby indicating that the drive member has engaged the plunger.

16. The injector system of Claim 1 wherein the plunger engagement detection device comprises a sensor disposed on the drive member or the plunger.

17. The injector system of Claim 1 wherein the sensor reads the encoded syringe information when the syringe is mounted on the injector.

18. The injector system of Claim 17 wherein the drive member automatically advances and engages the plunger when the sensor reads the syringe information encoded on the syringe.

19. An injector system comprising, in combination, an injector and a syringe for injecting fluid into a patient, the syringe comprising:

- a body;

- a plunger movably disposed within the body; and

- an encoding device providing syringe information; and

the injector comprising:

- a housing;

- a motor disposed within the housing;

- a controller operably associated with the motor;

- a sensor operably associated with the controller and operable to read the encoded syringe information provided by the encoding device;

- a drive member disposed in the housing and powered by the motor, the drive member operable to automatically advance and engage the plunger when the syringe is mounted on the injector; and

- a plunger engagement detection device operably associated with the controller and operable to indicate when the drive member of the injector has engaged the plunger of the syringe;

wherein the injector controller determines that the syringe is empty from the syringe information provided by the encoding device and causes the drive member to advance the plunger forward within the syringe body to expel air from the syringe.

20. An injector system comprising, in combination, an injector and a syringe for injecting fluid into a patient, the syringe comprising:

- a body;

- a plunger movably disposed within the body; and

an encoding device providing syringe information; and
the injector comprising:

a housing;

a motor disposed within the housing;

5 a controller operably associated with the motor;

a sensor operably associated with the controller and operable to read the encoded
syringe information provided by the encoding device;

a drive member disposed in the housing and powered by the motor, the drive
member operable to automatically advance and engage the plunger when the syringe is
10 mounted on the injector; and

a plunger engagement detection device operably associated with the controller and
operable to indicate when the drive member of the injector has engaged the plunger of the
syringe;

wherein the injector controller determines that the syringe is prefilled from the
15 syringe information provided by the encoding device and substantially stops forward
advancement of the drive member upon engagement of the drive member with the
plunger.